

## THE DIRECTOR'S REPORT

THE ARNOLD ARBORETUM DURING THE FISCAL YEAR ENDED

JUNE 30, 1966

THE EVENT WHICH DOMINATED the past year at the Arnold Arboretum was the decision rendered by the Supreme Judicial Court of Massachusetts in the case of the "Attorney General *vs.* President and Fellows of Harvard College." The Attorney General, alleging a breach of trust, had sought to compel the University to reverse its approval of a close association between the Arboretum and other departments of biological study at Harvard and of the location of certain activities and resources of the Arnold Arboretum in Cambridge, thereby forcing their return to Jamaica Plain. In a long opinion submitted by a majority of the Court (three justices) with two justices dissenting, the Court allowed for the continued close coöperation between the Arboretum and the University. The Court also found that "the effects of the move do not show that inadequate consideration was given to probable results or that bad judgment was exercised." The Court noted that "What we have said disposes of the contention that the move itself, so far as carried out as voted, was a breach of trust. We disagree with the view of our dissenting colleagues that it is implicit in the Indenture that the place of such implied related activities as the library and herbarium, if established, be the place specified for the growing of the trees, shrubs and plants. The dominant consideration is that those things and only those things be done that will, in the good judgment of the Corporation, promote the express purposes of the Indenture."

The Court did question whether "the implementation of the resolution of January 19, 1953, does not, or may not, conform to its terms." That resolution (cf. The Director's Report on the Arnold Arboretum, Jour. Arnold Arb. 35: 367-381. 1954) "calls for the retention at Jamaica Plain of 'such books and specimens as may be required to provide there a working library and herbarium'." The "resolution required that the books and specimens to be housed at Cambridge be appropriately identified." The Court found that an "implication from the master's observation . . . may be that the intention of the Corporation's vote has not been met." The Court also ordered that "The rescript shall provide that the county court retain jurisdiction of the cause and that the defendant shall file with the clerk within six months of rescript (a) a report to it by the Arnold Professor or other appropriate person that in the Corporation's judgment shows either that an adequate working library and herbarium exist at Jamaica Plain or recommends the steps to cause them



to exist; (b) a report of its proposals or action to amplify the catalogue and general listing references; and (c) a report of its proposal or action in respect of a general designation on or within the Harvard University Herbarium."

The required report showing the nature of the herbarium and library for horticultural research which are maintained in Jamaica Plain has been approved by votes of the President and Fellows and transmitted to the single justice for the entry of the final decree.

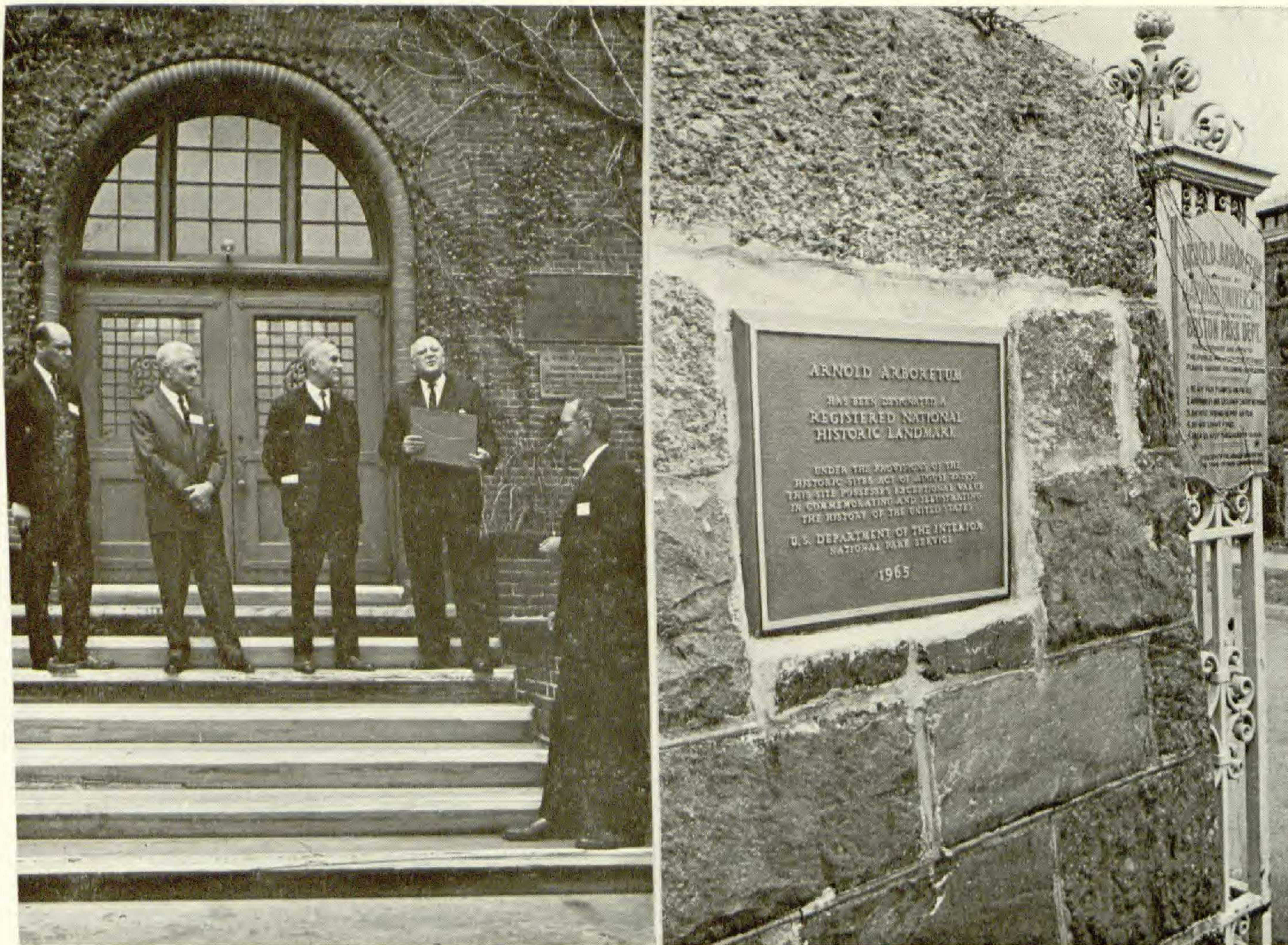
Since the decision of the Court in this litigation did not require the removal from Cambridge and the return to Jamaica Plain of all the books and specimens transferred in 1954, it is now possible for the staff to plan for permanent changes and improvements in the existing facilities in Jamaica Plain. Consequently, contracts were placed in the spring for (1) an additional unit at the Dana Greenhouses, constituting a one-third expansion; (2) air-conditioning of the laboratory for cytology and plant morphology; (3) new lighting in the library of the Administration Building; (4) changes in office arrangement.

In the Harvard University Herbaria in Cambridge equally important consideration must be given because of growth of collections and increase in personnel and visitors for whom facilities are now limited by the physical plant. The decision of the Supreme Judicial Court of Massachusetts was necessary before any new programs could be proposed. The staff believes that the present organization and locations will permit the goals of the Arnold Arboretum to be extended and is hopeful that the hesitation and uncertainty of the past are, indeed, over.

Two small sections of land have been officially incorporated into the Arnold Arboretum during the year. One piece of approximately five acres, including a house at 383 South Street, was in the title of the Bussey Institution. With the taking of the major part of the Bussey Institution property by the Commonwealth of Massachusetts in 1963, this area, adjacent to the collections of the Arboretum, remained. It has been used by the Arboretum staff and the house has been occupied by a staff member as an essential guard post for one corner of the grounds. The Corporation in a vote of June 6th approved that "the land shall be held and used for the general purposes of the Arnold Arboretum" and "in consideration the fair market value of \$71,000.00 be transferred from the Martha Dana Mercer Trust gift held for the purposes of the Arnold Arboretum to the Bussey Institution Endowment."

A second piece of land in the northwest corner of the Arboretum was isolated from the main collections and could not be developed because of the use and retention of ownership of an old roadway by the Department of Public Works. After many years of effort the title to this isolated right-of-way was transferred to the owners of the abutting property, Harvard University and the City of Boston Department of Parks and Recreation, respectively, and its use given to the Arnold Arboretum. We deeply appreciate the efforts of the Commissioner, Mr. William J. Devine, and of his associates, Mr. Arthur J. O'Keefe and Mr. Daniel Byrnes,





LEFT: Mr. Edwin Small of the National Park Service presenting certificate designating the Arnold Arboretum a National Historic Landmark. Left to right, Mr. Henry Scagnoli, Mr. L. Gard Wiggins, Mr. A. H. Parker, Jr., Mr. Small and (far right) Dr. R. A. Howard.

RIGHT: The bronze plaque at the main entrance to the Arnold Arboretum.



in making this land available. The expansion of the conifer collection and the development of additional plantings of ornamental apple trees in this area, along United States Route 1, will greatly enhance the site for visitors approaching Boston.

Much time was devoted by the staff to securing aid to defeat a bill submitted to the Massachusetts legislature ordering the construction of a ski tow within the Arnold Arboretum, on Peters Hill. Although the bill was filed by a representative living in Jamaica Plain, the legislature properly realized that passage and implementation of it would destroy a major collection of apples and crab apples, and defeated the bill by voice vote. The staff is grateful to the many Friends of the Arboretum whose aid in contacting their representatives and expressing their disapproval was essential in defeating the bill.

A pleasant occasion to record occurred on May 17 during the meeting of the Committee to Visit the Arnold Arboretum. At that time Mr. Edwin Small, of the National Park Service, representing Stewart L. Udall, Secretary of the Interior, presented the certificate officially recognizing the Arnold Arboretum as a National Historic Landmark. Mr. A. H. Parker, Jr., Chairman of the Committee, accepted the certificate for the Arnold Arboretum. Also present were Mr. Henry Scagnoli, representing John F. Collins, Mayor of the City of Boston; Mr. L. Gard Wiggins, representing Mr. Pusey and the Harvard Corporation; and Mr. Daniel Byrnes, representing Mr. Devine and the Department of Parks and Recreation. Earlier in the year a bronze plaque was placed on a gate post at the main entrance to the Arboretum.

### Staff:

The retirement of one staff member and the resignation of four others took place during the past year. Mrs. Lilian Burian, who had mounted herbarium specimens for ten years, retired on January 30th. Dr. Theodore Dudley, Assistant Horticultural Taxonomist, resigned to accept a position at the U. S. National Arboretum. Mr. Peter Green, Horticultural Taxonomist, resigned to join the staff of the Royal Botanic Gardens at Kew, and Dr. Keith Ferguson resigned to work as a Fellow on the Staff of the Flora Europaea Research Project. Dr. Mary Sanders accepted an appointment at the Mount Alto Campus of the Pennsylvania State University, and resigned her appointment as Research Associate.

The appointment of Dr. Harrison Leigh Flint as Associate Horticulturist was approved by the Corporation to become effective near the end of the present fiscal year. Dr. Flint, whose research interests include problems of winter hardiness of woody plants, joins us from the staff of the University of Vermont. Miss Dulcie Alicia Powell, formerly of the staff of the Institute of Jamaica, Kingston, Jamaica, was appointed Research Fellow, and will continue her work on the cultivated ornamental plants of tropical areas. Miss Stephanie Barry Sutton was also appointed





Results of damage caused by severe snow storm of January 23, 1966. LEFT: Trees in the *Quercus* collection with broken branches. RIGHT: Damage to branches of this 40-year-old *Cercidiphyllum* necessitated complete removal of the tree.



a Research Fellow and continues her work toward a biography of Charles Sprague Sargent and a history of the Arnold Arboretum.

The promotion of Dr. Thomas G. Hartley to be Associate Curator of Pacific Botany was approved by the Corporation, to become effective during the next academic year.

Five Mercer Research Fellows were appointed during the year for varying lengths of time. Dr. Charles Tseng, of Windham College, Putney, Vermont, is carrying on morphological studies in the Araliaceae. Mr. Pablo Legname, of the Instituto Lillo, Tucuman, Argentina, has undertaken studies on the unworked collections from Argentina in the herbarium of the Arnold Arboretum. Appointments as Mercer Fellows in the area of horticulture, for work with the living and herbarium collections, were made to Miss Sandra Shannon, of the University of Massachusetts; Mr. Frank Wolfe, of the University of Vermont; and Mr. William Gensel, of the University of Rhode Island.

Among honors to staff members was the award of the Jackson Dawson Medal of the Massachusetts Horticultural Society to Mr. Alfred Fordham. It was accompanied by the citation, "To Alfred James Fordham, who following in the footsteps of famous propagators at the Arnold Arboretum, is doing much to maintain the high standards set by them years ago in this often difficult and sometimes most perplexing art."

Dr. Wyman was presented the "Silver Alder Leaf" by the Scandinavian Horticultural Congress, at Aulanko, Finland, in July, 1965.

### Horticulture:

The drought which has plagued New England and which has been mentioned in several recent reports continued during the fall and winter of this past fiscal year. The records show that the calendar year 1963 ended with the total rainfall 7.93 inches below average, 1964 was 6.30 inches below normal, while 1965 had a deficiency of 16.76 inches from the 44 inches normally expected at the Arnold Arboretum. The first four months of 1966 were 3.26 inches below normal, but the drought appeared to be broken, at least temporarily, by occasional heavy showers during the early part of June. The effects of a long continuing drought, however, are very evident in the resultant loss of plants. The few ponds in the Arboretum remained dry again during the summer of 1965, indicating how low the water table had dropped.

In addition to the dry spell, the grounds were also affected by surface fires caused by carelessness and vandalism. Twenty-one separate fires were recorded during the past year. Fires beginning at the base of Bussey Hill have severely damaged plantings of azaleas so that many large plants have had to be pruned to the base in an attempt to save them.

Adding to the damage caused by the continued drought was a major storm on January 23rd with a heavy wet snow which remained on the branches of shrubs and trees. Colder weather following the storm caused



the weighted branches to break. Bushes bent by the accumulation of snow remained frozen in abnormal positions. The damage is now particularly obvious in the collections of *Thuja* and *Chamaecyparis*, in many of the azalea plantings, and in the shrub collection and nursery area.

The planting program, drastically limited in the last two years, had to be resumed during the past spring because of the accumulation of plants in the nurseries. Over 1000 plants were added to the living collections. New azalea plantings numbered 265. About 50 new *Cytisus* plants were added to the collection on Bussey Hill.

One purpose of Dr. Wyman's travels through Europe during the spring and summer of 1965 was to select from many sources, including botanic gardens, private gardens, nurseries, and the wild, plants worthy of introduction into the United States. During the current fiscal year material of 930 species and varieties of 119 genera was received, recorded, and propagated at the Arboretum. Of several thousand individual plants now growing in the greenhouse area, some will be ready for hardiness testing during the next year. These are included among the 167 shipments received during the year from 11 countries, comprising 1012 species and varieties. In addition, shipments of seeds received numbered 130 from 35 different countries, comprising 364 species and varieties. Many of the seeds were of specifically requested herbaceous species to be grown for anatomical studies, or of unusual species to be grown as vouchers and for representation in the herbarium of cultivated plants. In response to specific requests, the staff of the greenhouses distributed 109 shipments of seeds, representing 306 species and varieties, to 15 different countries. Plants and vegetative propagating material formed 173 shipments of 1009 taxa to ten countries. Included in these figures are twelve taxa of *Cornus*, *Ilex*, *Ligustrum*, *Magnolia*, *Malus*, *Pieris*, *Potentilla*, *Syringa*, and *Viburnum* which were offered to coöperating nurserymen as plants introduced or selected by the Arnold Arboretum and worthy of greater horticultural use.

A total of 389 taxa was propagated for replacements or additions to the collections on the grounds. One hundred and fifty-one taxa were propagated for taxonomic or analytical studies by staff members.

Continued experimental work in the greenhouse area concerned methods of plant propagation and the accumulation of data on seed germination. Through the year 112 taxa were processed for such investigations.

Work on the registration of cultivars continued, the publications including a check list for the genus *Weigela* and one issue of *Arnoldia* devoted to newly registered names in various genera. Inquiries for information and for the proper registration forms still far exceed actual returns. A full discussion of the registration procedure is planned for the International Horticultural Congress scheduled for the summer of 1966, when the future of cultivar registration may become more evident. Compilation of a listing of cultivars for the genus *Lantana* nears completion.

Dr. Dudley gave special attention to the material of *Viburnum* in our



herbarium of cultivated plants and to that obtained on loan from other institutions, as well as to the living collections. Mr. Green and Mrs. Rüdénberg continued their study of *Lonicera*, annotating many of the specimens in the Arboretum herbarium collections and making additional chromosome counts.

The horticultural herbarium received sizable and welcome additions from the collections made by Dr. Dudley on the Burpee Fordhook Farm and at other locations and by the gift of the herbarium of the American Herb Society.

A new edition of Dr. Wyman's book, *Trees for American Gardens*, was published by Macmillan at the end of December.

Changes of various sorts have been made at Jamaica Plain, some on the grounds which will become apparent in better landscaped plantings, more convenient paths for visitors, or healthier specimens; others will result in more efficient use of the facilities in the buildings, both for research and maintenance. On Bussey Hill a new retaining wall of natural boulders was constructed so that a level path could be established. Heavy mulching and the laying of a plastic pipe from South Street to the top of the hill, making water available for the first time, will improve the condition of both old and new plantings and enhance the general appearance of the collections. Adjacent to the oak collection on Bussey Hill a beginning has been made on the establishment of a collection of *Viburnum* species. At the base of Hemlock Hill many evergreen rhododendrons have been planted in mass.

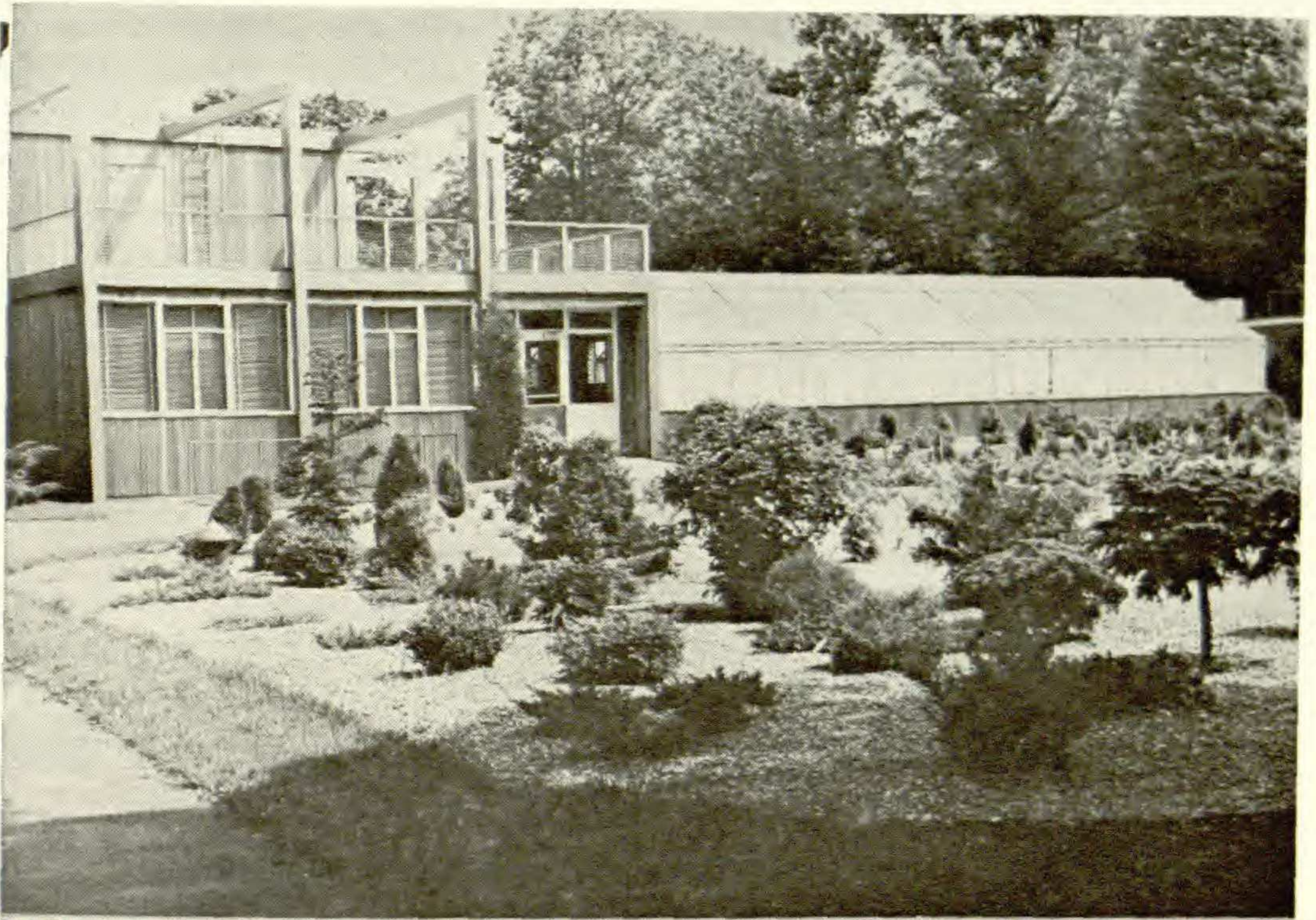
Work has commenced on the establishment of terraces and walks on the slopes below the *bonsai* house in the greenhouse area, using rocks obtained from the Case Estates in Weston. When completed this will become the location for the smaller plants of the genetic dwarf conifer study collection. Larger plants will continue to be placed in the area of the chestnut collection.

Much effort is being expended on the rehabilitation of the old Centre Street roadbed, obtained from the Department of Public Works by the Department of Parks and Recreation. The city has removed the work house and the Arboretum has contracted for the excavation of the road to a depth of about 3 feet, using this excavated material for filling in a swampy area and a dangerous pond on the South Street tract. Much fill will be needed in the roadbed, but localized plantings will be used in the meantime. In coöperation with the Department of Parks and Recreation a six-foot chain link fence is being erected around the new property.

The chain link fence bordering the Arborway was painted during the summer by boys in the Job Corps, a project directed by the City of Boston.

Also with the coöperation of the Department of Parks and Recreation, the gates to the Arboretum were closed to driving on week-ends during the months of May and June. With very few exceptions this practice has





ABOVE: Collection of genetic dwarf conifers in a temporary location near the Dana greenhouses. Mulch of gray stone is being used for these plants.

BELOW: Dry wall of natural boulders bordering the rebuilt beds of *Cytisus* on Bussey Hill.



met with the approval of those commenting, since it permits individuals and families to walk without concern for automobiles.

The problem of parking space on the periphery of the Arboretum remains unsolved. An even more serious problem is the continued vandalism within the Arboretum, with malicious cutting and felling of trees. Since the City was unable to supply additional police protection, special police were hired for the summer months to patrol the grounds during the evening hours.

With the coöperation of the planning office of the University and the Medical School branch of the Department of Buildings and Grounds, plans are being completed for a new garage facility to remove the mechanical equipment from its cramped and crowded quarters in the basement of the Administration Building.

### Case Estates:

It is pleasant to record again a marked increase in the use of the Case Estates, both by individual visitors and by groups requesting special tours. In both spring and fall, classes were held as afternoon walks around the grounds, and in May an Open House was held on what, unfortunately, was a cold, rainy Sunday. Parking for visitors remains a problem both on Wellesley Street and near the barn.



Display area at the Case Estates, Weston, for authentically named clones of *Hosta* sent from special collections in Sweden, England, and the United States.



One new planting has been established, and additions have been made to others. A display of mulching materials prepared for exhibit at the Spring Flower Show of the Massachusetts Horticultural Society, in 1964, aroused such interest that the plan was developed for use in Weston. Two long beds, 6 by 100 feet, were prepared in the fall and planted in the spring. Each bed is divided into units ten feet long, permitting the use of 20 different kinds of mulching materials. Instead of using the same plant materials in each bed an alphabetical arrangement of perennials by their generic names has been used, omitting only such "exotics" as genera beginning with "Q" and "X".

Additions have been made to the collection of *Hemerocallis*. New taxa of *Allium* have been acquired by gift and purchase in the hope of establishing a new bed for next year.

An experimental nursery planting of 132 trees was set out in the large field along Newton Street, and 89 trees of 37 species and varieties were added as display specimens in the same field.

The town of Weston was given 193 trees and shrubs in the fall of 1965 for planting in the town. All had been placed by spring, and a letter of appreciation for the gift was received from the members of the Weston Park and Cemetery Commission.

### Herbarium:

The decision of the Supreme Court granting permission to keep collections of the herbarium and library in Cambridge has made feasible a reëxamination of the herbarium building and its facilities. In 1954, when the collections were moved, the capacity of the building for the combined collections of the Arnold Arboretum and the Gray Herbarium was considered adequate for ten years' growth. It is now twelve years since the move occurred and the increase in the herbarium collections has exceeded what was expected, partly from the study and incorporation of previously unworked collections and partly from expanded and increased interest in plant groups and geographical areas not formerly studied by the Arboretum staff. A developing interest in the herbaceous plants of all floras has resulted in such material being studied, mounted, and inserted as a part of the Arboretum herbarium, rather than as formerly, being donated to, or exchanged with, other institutions, or even discarded. An increasing awareness of the importance of the floras of Africa and Australia, and the deficiency of our collections in these areas, have led to active efforts to increase our collections by gift or exchange with institutions working seriously on these floras. The collections so expanded will make available for research and teaching interesting representatives of the plant families characteristic of these parts of the world. As a result, the collections are increasing in a normal way for an active herbarium.

The number of staff, students, and visitors also increased since 1954 and should continue to do so. This, however, is straining the existing



working facilities beyond capacity. A small table and simple microscope are inadequate to cope with the newer and more sophisticated taxonomic techniques which require laboratory space and, often, photographic equipment. The building has become inadequate both for the staff needs and for housing the collections. In fact, it has become necessary to store certain groups of specimens in cardboard boxes on top of the steel cases.

In the horticultural herbarium in Jamaica Plain the situation for growth is more favorable. Case space is adequate for a decade of expansion, and space for more cases and for special laboratory facilities in the Administration Building is available.

During the year 18,647 specimens were mounted and added to the herbarium collections in Jamaica Plain and Cambridge, bringing the total number of sheets to 824,920. Also during the year 14,483 specimens were received, the greater portion by exchange. Special attention was given to the organization and distribution of plants from Brazil and Colombia collected about 1940 by Richard Evans Schultes, making available some extremely interesting representatives of that flora. A very important addition to the horticultural herbarium was the gift of the herbarium of the Herb Society of America which is now being appropriately marked to indicate its origin, and inserted into the herbarium. Access to this collection will, of course, be available to members of the Herb Society when needed, but the specimens will also be available on loan to monographers for research studies, and to the staff for reference.

During the past year staff members and students requested or received for identification 2,496 herbarium sheets representing 51 loans from 36 institutions. The staff filled requests for 120 loans to 65 institutions, including 16,491 specimens.

Arrangements were made during the year to collaborate with the Universidad Nacional Autónoma de México on the production of an ecologically oriented Flora of the State of Veracruz, México. The study will be under the direction of Dr. Arturo Gómez Pompa, a former Mercer Research Fellow, now Director of the National Herbarium of México. The staff of the Arnold Arboretum will collaborate in the study of the cultivated plants and by supplying assistance in herbarium, library, and research facilities. Dr. Lorin Nevling is expected to serve as coördinator for the rest of the staff.

Mr. Baranov prepared for publication taxonomic studies in the genus *Prinsepia* of the Rosaceae, and has completed a study of the morphological variation in *Sorbaria sorbifolia*. It is hoped that additional species and forms of these genera may be procured from the wild sources in Asia for cultivation in the Arboretum.

Dr. Brizicky devoted much attention to recent publications on cultivated plants and native floras from Russia. Since discussions at the 1966 International Horticultural Congress will consider the registration of cultivar names, problems of the code of nomenclature regarding translation and transliteration were the basis of a joint publication with Dr. Howard. He completed his studies of the Sterculiaceae and Goodeniaceae



for the generic flora of the southeastern United States and has turned to a study of the Malvaceae represented in the area.

Dr. Dudley continued his studies of *Alyssum* and its relatives, including the evaluation of hardiness trials of many species introduced to the United States for the first time and grown at the Case Estates. He completed a review of Asian species of *Viburnum*. He also compiled bibliographic information on taxa of *Sambucus* under cultivation, preliminary to the publication of a cultivar registration list for the genus.

Dr. Ferguson completed the revision of the Cornaceae, Caprifoliaceae, and Chenopodiaceae for the generic flora of the southeastern United States.

Mr. Green was fortunate to be able to establish collaboration with botanists in Australia interested in the floras of Lord Howe and Norfolk Islands, since he has turned his attention to a review of the flora of these islands with special emphasis on the origin and distribution of the plants and the nature of the plant communities involved. He completed a study of the cultivated taxa of *Jasminum* which was published in *Baileya*. A review of the species and hybrids in the *Lonicera tatarica* complex was also completed and has been published.

Dr. Hartley's monographic study of the genus *Zanthoxylum* in Malesia is being prepared for publication. He is continuing studies of his own collections from New Guinea and those of some other expeditions sponsored by the Arboretum or received as exchange.

Dr. Howard received several collections of plants representing native and cultivated floras of the West Indies, among which special collections from the Bahamas, Bermuda, Tortola, and small adjacent and poorly known islands, and from Puerto Rico represented valuable additions to the herbarium. The study of the mossy summit forest on Pico del Oeste in the Luquillo Mountains of Puerto Rico is well under way. Coöperative environmental studies done with the National Center for Atmospheric Research have permitted the establishment of accurate weather instruments in a small building on the summit and within the elfin forest. Both automatic and manual recording instruments are being used to make various kinds of measurements related to environmental factors. Vegetational studies include measurement of growth of parts, persistence of leaves, time of flowering and fruiting, observations on pollination methods or pollinators, and on seed and fruit dispersal. Dr. Nevling and Mrs. Rüdénberg are collaborating on the cytological study of species within this forest. This complete and detailed biological-environmental study is made possible by a grant from the National Science Foundation and with the coöperation of many people and institutions in Puerto Rico and the continental United States. The permission of the Forestry Service of the Commonwealth of Puerto Rico for the use of this land is gratefully acknowledged. The contribution by Mr. Joseph B. Martinson of facilities for housing the field staff is most important in the development and continuation of this work.

Dr. Hu continued her work on the Compositae of China. The first three parts of this study, representing approximately one-third of the



total, have been published. Dr. Hu is also writing special treatments of the genus *Hemerocallis* for a Daylily Handbook being prepared by a committee of the American Horticultural Society and the American Hemerocallis Society.

Dr. Nevling, as Supervisor of the Herbarium of the Arnold Arboretum and Supervisor of the Gray Herbarium, has directed various projects involving the two collections. He has continued his studies of the Thymeleaceae, devoting special attention to South American genera and species in preparation for field work in Brazil, Venezuela, and Trinidad. He has also worked with Dr. Howard in the field study of the mossy forest noted earlier.

Dr. Perry has made much progress in handling the Cape York, Australia, collections of the Archbold Expedition of 1948. With the collaboration of Dr. Hartley these collections have been labelled, at least partly named, and divided into sets for distribution.

Dr. Schubert has completed a treatment of the genus *Desmodium* for the *Flora of Panama* and is working on treatments of the genus for the *Flora of East Tropical Africa* and the *Flora Zambesiaca*. Together with Dr. Lyman Smith of the Smithsonian Institution she is continuing a review of the genus *Begonia* in Colombia, to bring up-to-date a study published by the same authors in 1946. The first of a series of investigations of the genus *Dioscorea* was published during the year and further work on the genus is in progress. Dr. Schubert visited Belém, Pará, Brazil, in December and spent time there collecting in the Area de Pesquisas Ecologicas do Guama, an ecological study area maintained cooperatively by the Smithsonian Institution, The Instituto Agronómico do Norte, and the Belém Virus Laboratory of the Rockefeller Foundation. With the aid of representatives of these institutions she was able to obtain specimens of considerable interest.

Dr. Wood continued his direction of the project concerned with the generic flora of the southeastern United States. He has supervised the preparation of illustrations and edited and contributed to the manuscripts published during the past year. He did field work in Florida during the spring, collecting material for critical studies and for illustration. He continued to serve actively on the Subcommittee for Family Names of the Committee for Spermatophyta, which is now concentrating its efforts on the names of families of living gymnosperms. During the spring Dr. Wood served on a committee of the American Society of Plant Taxonomists which met at the Smithsonian Institution to consider the feasibility of a Flora of North America.

We are pleased to have had many visitors who worked on special groups in our collections. In addition to the Mercer Research Fellows, Dr. Charles C. Tseng and Mr. Pablo Legname, Mr. Lindsay Smith of Brisbane, Australia, visited the Herbarium to study species of *Lantana* which have become noxious weeds in Australia. Mrs. S. G. M. Carr devoted her attention to the extensive collections of *Eucalyptus*. Mr. Ramón Riba, a Guggenheim Fellow, has come from the University of



Mexico to study tree-ferns. Mr. Lucio Quimbo from the College of Forestry, University of the Philippines, was particularly interested in the large wood collection with herbarium specimen vouchers.

### Library:

The status of the library of the Arnold Arboretum was also affected by the decision of the Supreme Court permitting the retention of books in Cambridge. Since a complete reorganization of the whole library is not now necessary, it has been possible to initiate a rearrangement of the horticultural library in Jamaica Plain to make it more easily usable. The work of cataloguing the material in the new arrangement will, of necessity, continue through the summer, but an important start has already been made this year. The new arrangement will permit greater use of the library in association with the horticultural herbarium and make it easier to use the library in the reference room as an open-stack-library.

In the catalogue of the combined libraries of the Arnold Arboretum and the Gray Herbarium in Cambridge the librarian, Mrs. Schwarten, is indicating the ownership of the book on each catalogue card, and for the Arboretum books, specially marking each one housed in Jamaica Plain. This work has been completed for about one-half of the catalogue and the whole task should be finished within this calendar year.

During the year 431 bound volumes were added to the library of the Arnold Arboretum. The total count of bound volumes is 53,295. Reprints numbering 320 were catalogued bringing the total of the reprint collection to 20,594. The annual increment of 3000 cards was added to the *Card Index of American Plants* published by the Gray Herbarium and 2650 cards were added to the *Index to American Botanical Literature* published by the Torrey Botanical Club. Series 21 to 23 of the *Index Nominum Genericorum* were received and incorporated into that file. Approximately 900 reference cards were prepared and added to the Rehder index of cultivated plants.

Miss Stephanie Sutton continues her work on the history of the Arnold Arboretum, on the biography of Charles Sargent, and on the organization of the historical correspondence of the Arboretum. During the year Miss Sutton made a study trip to England to consult letters of Charles Sargent in the files of the Royal Botanical Gardens, Kew, the British Museum (Nat. Hist.), and at the library of the Royal Horticultural Society. The assistance rendered Miss Sutton in this search is gratefully acknowledged, as are the many photocopies of letters to and from Sargent which have been sent from many institutions and individuals in the United States. It is hoped that still other letters representing different periods or other facets of Sargent's life will be found.

The Arboretum received several large collections of reprints and personal files and also collections of books. The work on the reorganization of the reprints of Professor Joseph Faull, described in earlier reports, is now nearly complete, and the collection is in usable condition. The com-



plete files of Harlan P. Kelsey have proven to be extremely valuable for their material pertaining to the Arnold Arboretum, to the introduction of native species into cultivation, to the development of standardized plant names, and to the development of natural areas and national parks. Materials from this gift concerned with city planning have been transferred to the Harvard University Library of the Graduate School of Design. The numerous letters are being classified and will be available for research purposes.

During the year Mrs. George Hamor presented to the Arboretum many books from the library of her late husband which increase our source material on agriculture and botany in the American tropics, especially in the West Indies.

The library also had many visitors during the year. Among the very special projects in which our collection was of great usefulness we note that of the Rachel McMasters Miller Hunt Botanical Library to photograph the title pages of books of botanical and horticultural interest. Since much of the material is most conveniently available here, we are glad to allow it to be photographed and reproduced.

### Comparative Morphology:

Professor Bailey has continued his research on the primitive leaf-bearing Cactaceae under an extension of his grant from the National Science Foundation. A paper considering the significance of the reduction of vessels in the Cactaceae is being prepared. Investigations also have been made of the biochemical nature of materials within the tissues of these plants.

Professor van der Schijff, Mercer Research Fellow from the University of Pretoria, continued his studies of the peculiar growth characteristics and enlarged subterranean stem development of species of the Leguminosae. Some of the new techniques being developed for work associated with electron microscope studies were modified for application to special problems of fixation and sectioning of this difficult material.

Dr. Charles Tseng continued his studies of the pollen and floral morphology of the Araliaceae and Umbelliferae.

Dr. Howard concentrated his studies of nodal and petiolar anatomy on plants from the mossy forest study area in Puerto Rico, and to variations in the secondary body developed in leaves of more than one year's duration.

### Cytology and Genetics:

Mrs. Lily Rüdénberg developed her studies of the taxa of *Lonicera* under cultivation in the Arnold Arboretum in conjunction with the systematic investigations of Mr. Green. Chromosome counts have now been obtained for all but a few of the most recent introductions and a publication recording the counts and the documenting herbarium specimens is soon to be published.



Dr. Nevling and Mrs. Rüdénberg are both participating in the cytological study of the component species of the mossy forest in Puerto Rico. The 84 genera of flowering plants in the area present a variety of difficulties in the search for division figures in which the chromosomes can be counted. Accurate chromosome counts have been obtained in certain plants only from buds collected in the early morning hours, while in other taxa the most active stages of microspore division figures seem to occur at different hours or in different sequences. The length of stages in which divisions can be obtained also seems to vary considerably among the species comprising the elfin forest.

### Education:

No formal courses were given by members of the Arboretum staff, but several of them were special lecturers in a course in Plant Geography, or supervised the work of students. Informal field classes were offered at Jamaica Plain under the direction of Dr. Wyman and on the Case Estates in Weston by Dr. Hartley. A course in Plant Propagation was offered throughout the year by Mr. Fordham. The staff took part in the regular series of weekly seminars held in the Herbaria in Cambridge.

The Arboretum staff served as host to various visiting groups for conducted tours, special seminars, and general discussions or provided space and facilities for meetings. The horticultural judging and identification competition sponsored jointly by the University of Massachusetts, the Massachusetts Department of Agriculture, and the Boston Public Schools was held in the auditorium of the Administration Building. The mid-winter meeting of the Northeast section of the American Society for Horticultural Sciences was held in the lecture rooms of the Biological Laboratories and in the Harvard University Herbaria in Cambridge. A special open house in Jamaica Plain and an invitation to visit all of the Arboretum facilities was extended to members of the Department of Biology of Harvard.

The Arboretum was represented at many national and international meetings and several staff members presented papers. Mr. Fordham attended the annual meeting of the International Plant Propagators' Society, the meetings of the American Society for Horticultural Science and the Horticultural Day program at the University of New Hampshire and spoke on all these programs.

Dr. Hartley attended the public symposium "Scientific Aspects of Pest Control," arranged by the National Academy of Sciences, National Research Council, held in Washington, D.C.

Dr. Howard, as lecturer for the American Institute of Biological Sciences visited the campus of Ohio University in Athens, Ohio. He spoke about the Spice Trade of Colonial New England at the Gardeners' Workshop at Sturbridge Village; to the Connecticut Nurserymen's Association short course at the University of Connecticut, and on the lecture series of the New York Botanical Garden. He attended the meetings of the



American Association of Botanic Gardens and Arboreta where he led a discussion of cultivar registration procedures; the annual meeting of the American Horticultural Society, at Callaway Gardens in Georgia; the meeting of the Directors of Systematic Collections at the Bishop Museum in Honolulu, and of the scientific advisory board of the Fairchild Tropical Garden in Miami; and represented the Arboretum at the celebration of the centennial of the Smithsonian Institution. At the request of the Department of Global Medicine of the U.S. Naval Medical School in Bethesda, Maryland, Dr. Howard presented a program on the medical significance of the vegetation of southeast Asia, considering the edible, poisonous, and dangerous plants of the area. The program was later taped in color for television use and as an educational film.

Dr. Nevling presented a paper during the symposium on the Biota of the Amazon Basin, on the need for further material and knowledge of tropical American taxa of uncertain systematic position, particularly in relation to activity in the proposed International Biological Programs.

Dr. Wood was invited to lecture at Kent State University on his work with carnivorous plants and on the generic flora of the southeastern United States.

Dr. Wyman addressed the Scandinavian Horticultural Congress in Aulanka, Finland. He attended the American Horticultural Society annual meeting in Georgia, and spoke on the program of the Clara B. Ford Garden Forum in Dearborn, Michigan, the Williamsburg Garden Symposium, the Farm and Home Week of the University of Maine, and at the Western Association of Nursery Men in Kansas City. He also presented a special workshop on "Trees, shrubs and vines for small gardens" for the Brooklyn Botanic Garden.

### Travel and Exploration:

The convenience and speed of air travel and the availability of federal and foundation grants to support field work and attendance at scientific meetings have made it possible in recent years for botanists and horticulturists to travel widely.

Dr. Dudley visited several gardens in New York, New Jersey, and Pennsylvania to collect specimens for the horticultural herbarium. Mr. Fordham continued his field studies of naturally occurring witches' broom in conifers in several New England states and visited six botanical gardens and arboreta in Ohio. Dr. Howard and Dr. Nevling made two study trips to eastern Puerto Rico during the year. Dr. Nevling attended a symposium in Belém, Pará, Brazil, and en route was able to do field work on plants of his speciality near Rio de Janeiro, in Venezuela, and in Trinidad. Dr. Schubert attended a council meeting of the Association for Tropical Biology, also in Belém, and spent a week collecting near there. Miss Sutton made a trip to England to carry on her biographical and historical investigations. Dr. Wood took part in one of the study trips to Puerto Rico and was able to have several weeks in the field in Florida



where he collected from Tampa to the Florida Keys and northward to Jacksonville. Dr. Wyman completed his European trip during the present fiscal year.

Members of the staff are most grateful to all those individuals who helped in various ways to make their trips both successful and interesting.

### Gifts and Grants:

Three grants were received by staff members from the National Science Foundation. Dr. Howard was awarded a grant for two years to study the biology and environment of the mossy or elfin forest in Puerto Rico. A one-year grant to Dr. Wood is a terminal grant for the project on the generic flora of the southeastern United States. The National Science Foundation has supported this work generously for the past ten years. Dr. Bailey received a grant to continue his investigations of the leaf-bearing Cactaceae.

In addition, a travel grant from the Association for Tropical Biology supported the work and travel of Dr. Nevling in Brazil. Special anonymous gifts were used to aid the travel of Dr. Wyman in Europe and of Miss Sutton in England.

An appeal to the Friends of the Arnold Arboretum brought renewed contributions from many loyal supporters. This assistance is used entirely for work in horticulture and on the grounds of the Arnold Arboretum unless otherwise designated. Certain groups of plants and certain of the plantings in the Arboretum have their own special friends who designate the purposes of their gifts. It is a pleasure to carry out such wishes.

Every year special gifts of books, herbarium specimens, botanical prints, plants, Kodachrome slides, and photographs are received from many sources. Special acknowledgment is sent directly to these donors for their interest in and generosity to the Arboretum.

### Publications:

The regular publications of the Arnold Arboretum are the *Journal of the Arnold Arboretum* and *Arnoldia*.

The *Journal* was edited by Dr. Schubert and the four issues published during the year comprised 430 pages and 25 articles. Publication of the letters from Charles Sprague Sargent to Reginald Somers Cocks, edited by Dr. Joseph Ewan of Tulane University, was completed in this period. A detailed bibliographic study of Grisebach's *Flora of the British West Indian Islands* was contributed by the British botanist William T. Stearn. A group of related papers on a new genus of palms by Dr. Harold E. Moore, Jr., and Dr. Natalie Uhl of the Bailey Hortorium and Dr. P. B. Tomlinson of the Fairchild Tropical Garden represent another of the interesting contributions published during the year.

During Dr. Wyman's absence *Arnoldia* was edited by Mr. Green. The twelve issues during the year contained a variety of articles on horticultural topics ranging from a check list of cultivars in *Weigela* to new and



additional pictorial studies of tree barks. One issue devoted to plants which could be used to screen junk yards and dumps has been reprinted twice and, by request, rewritten slightly for other magazines.

A new section "Arnoldia Reviews" will appear from time to time to call attention to publications of interest in horticulture, botany, and forestry.

A cumulative index to the nine volumes of the *Symbolae Antillanae* of I. Urban was issued as a special publication. The Index was prepared by Miss Carroll and Miss Sutton, under the direction of Dr. Howard, who prepared a biographical sketch of Dr. Urban.

A set of 18 postcards was printed to supplement and replace those already issued. In response to special requests cards of the *bonsai*, fall foliage colors, and winter scenes were included. Two new brochures with new maps of the Arnold Arboretum and the Case Estates were prepared by Miss Jeanne Taylor.

The bibliography which follows includes 56 articles and books by members of the staff, published during the past fiscal year.

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RICHARD A. HOWARD, *Director*



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during at least part of fiscal year 1965-1966

WILLIAM GENSEL, University of Rhode Island, Providence, Rhode Island.  
PABLO RAUL LEGNAME, Instituto Lillo, Tucuman, Argentina.  
SANDRA SHANNON, University of Massachusetts, Amherst, Massachusetts.  
CHARLES C. TSENG, Windham College, Putney, Vermont.  
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Africa.  
FRANCIS H. WOLFE, University of New Hampshire, Dover, New Hamp-  
shire.



## Staff of the Arnold Arboretum

1965-1966

RICHARD ALDEN HOWARD, Ph.D., Arnold Professor of Botany, Professor of Dendrology, and Director.

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IRVING WIDMER BAILEY, S.D., Professor of Plant Anatomy, *Emeritus*.

KARL SAX, S.D., Professor of Botany, *Emeritus*.

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PRISCILLA JEAN JAMES-ASHBURNER, M.A., Business Secretary.

ANDREY I. BARANOV, Curatorial Assistant.

GEORGE KONSTANTINE BRIZICKY, R.N.Dr., Botanist, Southeastern Flora Project.\*

MICHAEL ANTHONY CANOSO, M.S., Senior Curatorial Assistant.\*

HENRY DRAPER, Superintendent, Case Estates.

THEODORE ROBERT DUDLEY, Ph.D., Assistant Horticultural Taxonomist.\*\*

IAN KEITH FERGUSON, Ph.D., Botanist, Southeastern Flora Project.\*†

ALFRED JAMES FORDHAM, Propagator.

PETER SHAW GREEN, B.Sc., Horticultural Taxonomist.††

WILLIAM ED GRIME, B.A., Curatorial Assistant.\*

THOMAS GORDON HARTLEY, Ph.D., Assistant Curator.

HEMAN ARTHUR HOWARD, Assistant Horticulturist.

SHIU-YING HU, Ph.D., Botanist.

MARGARET CATHERINE LEFAVOUR, Herbarium Secretary.

LORIN IVES NEVLING, JR., Ph.D., Associate Curator and Supervisor of the Herbaria.\*

DULCIE ALICIA POWELL, M.A., Research Fellow.

MARY ELIZABETH SANDERS, Ph.D., Research Associate.†††

BERNICE GIDUZ SCHUBERT, Ph.D., Associate Curator and Editor.

LAZELLA SCHWARTEN, Librarian.\*

STEPHANNE BARRY SUTTON, A.B., Research Fellow.

ROBERT GEROW WILLIAMS, B.S., Superintendent.

CARROLL EMORY WOOD, JR., Ph.D., Associate Curator.

DONALD WYMAN, Ph.D., Horticulturist.

\* Appointed jointly with the Gray Herbarium.

\*\* Resigned January 31, 1966.

† Resigned February 28, 1966.

†† Resigned May 13, 1966.

††† Resigned October 1, 1965.